

Diagnosing Dicamba Injury

How to Distinguish Dicamba Injury from Other Problems

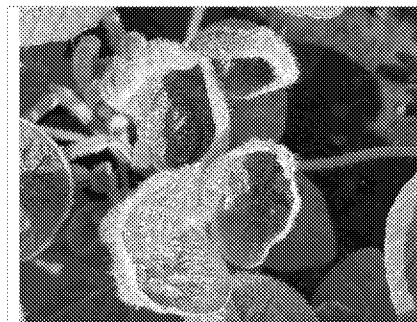
6/28/2018 | 2:09 PM CDT



By Emily Unglesbee, DTN Staff Reporter

Connect with Emily:

@Emily_Unglesbee



As a plant growth regulator, dicamba injury symptoms will appear only on new soybean growth, such as these young trifoliolates. (Photo courtesy Aaron Hager, University of Illinois)

ROCKVILLE, Md. (DTN) -- If you hear hoofbeats, the old saying goes, think horses -- not zebras.

Weed scientists want you to recall that saying when you walk soybean fields this year and spot puckered, cupped leaves in new soybean trifoliolates. With 40 million acres of dicamba-tolerant soybeans around to potentially be sprayed, these symptoms are most likely what University of Tennessee weed scientist Larry Steckel calls "the unmistakable fingerprint" of dicamba.

On social media and elsewhere, some growers and company representatives are suggesting other potential sources of cupped soybeans, such as AMS, other herbicides, drought and even nutrient deficiencies. Although some products and plant pests can cause leaf distortions that share some symptoms with dicamba injury, they are rare and can be distinguished with proper examination, weed scientists told DTN.

As June draws to a close, dicamba injury complaints are mounting in the South and Midwest. University of Illinois weed scientist Aaron Hager estimates that 150,000 acres of soybeans are showing these symptoms across Illinois. Steckel says Tennessee is now showing around 10,000 acres of injured soybeans, up from 2,000 last week, and the Missouri Department of Agriculture is now reporting nearly 12,500 damaged soybean acres. A report compiled by the University of Missouri stated that as of June 15, dicamba injury had been spotted on more than 383,000 acres across soybean-growing states -- a number that has immediately become outdated as new reports of damage crop up every day.

WHAT DICAMBA LOOKS LIKE

Soybean injury from dicamba is very distinctive, Hager said.

"The outer margins of trifoliolate leaves are rolled inward, sometimes very tightly," he said. The tips of the cupped leaves can be brown or cream-colored, and the veins on their underside often become parallel. "If dicamba is involved, you will not see this on the older leaves, but on the younger leaves and new growth," Hager added.

When all of these symptoms occur together in a field, dicamba is almost certainly the culprit. "The source of the exposure is sometimes not obvious, but the symptoms are not in question here," Hager said.

One of the best ways to determine if dicamba caused the injury is to watch the new growth, Hager added.

"Dicamba works primarily by being translocated to the growing points of the plant," Hager said. "That's why you may not see symptoms on leaves already on the plant when the exposure takes place, as the chemical will quickly be concentrated in the growing regions. It will show up in two to three sets of trifoliolates that emerge after the exposure, depending on the dose."

Later on, dicamba damage can cause plants to drop pods, but most soybeans are not yet at that stage, added Steckel.

To aid in correct identification in the weeks ahead, a group of weed scientists and agronomists helped us unpack some common myths and mimics of soybean puckering:

AMS IN THE TANK

Liberty Link and Roundup Ready 2 fields showing cupped leaves are occasionally being attributed to contact injury from the combination of AMS (ammonium sulfate) and glufosinate or glyphosate in an application.

More Recommended for You

Waterlogged Field Woes

Heavy Rains Causing Headaches in Western Corn Belt

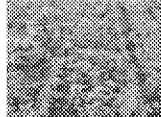


7/2/2018 | 3:19 PM CDT

Waterlogged cornfields are leading to concerns about nitrogen availability, as well as triggering...

Plan B for Dicamba

Spraying Dicamba? Better Have a Back-Up Plan



5/17/2018 | 11:22 AM CDT

A restrictive label and summer weather could conspire to sideline your dicamba applications, so it...

This is extremely unlikely, weed scientists and agronomists agreed.

"AMS causing cupping on leaves -- never in 25 years as a weed scientist have I seen that," Hager said.

Iowa State agronomist Clarke McGrath said he has seen some crop oil adjuvants and fertilizer, such as 28% UAN, cause leaf distortions under certain weather conditions but has not experienced that with AMS.

"With AMS going into almost every tank of postemergence herbicides being sprayed (except for Xtend beans) [in the Midwest], I would have expected to have seen any 'AMS cupping' phenomenon years ago in the heyday of glyphosate," he added.

Injury from AMS is more likely to cause symptoms like speckling, yellowing (chlorosis), and in severe cases, browning and leaf death (necrosis), Hager said.

OTHER HERBICIDES

Contact herbicides, like glufosinate, can cause speckling, yellowing, browning and even crinkling in leaves -- but only on old growth that made contact with the chemical, weed scientists said. Some Group 15 herbicides (such as Dual, Outlook or Warrant), can cause a "drawstring" effect in soybean leaves that causes wrinkling, but no cupping, said Daren Bohannon, a Bayer agronomist.

"When you get a drawstring effect, the outer leaf surface of trifoliate leaves that haven't completely expanded and finished growing, will temporarily stop growing, and the interior leaf between veins continues to divide cells and expand," he explained. Soybean leaves will take on a heart shape, with the tip of the leaf drawn inward.

Importantly, these symptoms usually only appear on foliage that was there when sprayer ran across the field, Bohannon said.

Plant growth regulator herbicides like dicamba, on the other hand, will produce injury symptoms exclusively on newly grown soybean leaves after the application, weed scientists noted.

Because of this, other plant growth regulator herbicides, such as 2,4-D and clopyralid, may be harder to distinguish from dicamba injury. However, while 2,4-D can cause a "slight up-cupping," the overall appearance is usually different, Steckel said. Leaves tend to be elongated, with veins running parallel, an effect called "strapping."

"The biggest difference between dicamba and 2,4-D is the sensitivity of the soybeans to dicamba," added Chris Boerboom, a North Dakota State University weed scientist. "It takes a fair amount of 2,4-D to really cause symptoms on soybeans compared to dicamba."

Studies have found that while clopyralid injury resembles dicamba injury, it often produces more thin, strapped leaves with parallel veins and less cupping injury, like 2,4-D.

Many of the reports blaming non-dicamba herbicides for cupped soybeans stem from confusion over where the dicamba could have come from, Hager noted.

Keep in mind that the new dicamba herbicides, while designed to be lower volatility, are not volatility-free, and much spraying has occurred in high temperatures in May and June, he said.

Research from the University of Missouri last summer showed that air samplers could detect dicamba in the air for 96 hours following most applications. That means the herbicide can move far off-target for days after an application, without the applicator realizing it moved at all, Hager said.

PLANT STRESS

In an email on June 25, Monsanto spokesperson Charla Lord announced that some of the alleged dicamba injury reports the company is receiving are actually the result of "plant abiotic stress (e.g. Iron chlorosis, drought, etc.)."

None of these stressors can cause soybean cupping, Steckel said.

Drought can cause wilting and drooping plants. "They fold over trying to hide from the sun," Steckel explained. Iron chlorosis will produce distinctive yellow leaves across an entire plant.

A rare syndrome known as rapid plant growth in soybeans can cause blistering and leaf strapping, but not cupping.

Read more about it from North Dakota State here: [https://www.ag.ndsu.edu/...](https://www.ag.ndsu.edu/)

Soybean aphids and thrips can cause slight cupping in soybeans, but the source in that case would be obvious, as this requires severe infestations to occur, said McGrath.

Some viruses such as bean pod mottle and soybean mosaic virus can cause down-cupping and bumpy leaf blistering, but the field pattern will show disease patches, rather than pesticide drift patterns, added Boerboom.

For more help, see this University of Wisconsin guide to dicamba injury and its mimics here: [https://learningstore.uwex.edu/...](https://learningstore.uwex.edu/)

Finally, reach out to your state Extension office if you have questions about symptoms in your field, Hager concluded.

"This situation will not improve based on speculation and opinions," he said. "We need to stay with science."

Emily Unglesbee can be reached at emilyunglesbee@dtm.com

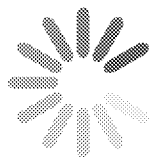
Follow her on Twitter @Emily_Unglesbee

(FS/GR/2AS)

Copyright 2018 DTN/The Progressive Farmer. All rights reserved.

DiM[1x3] LBL[] TMPL[feature] T[]

Related Content

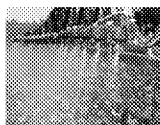


Dicamba Limits Sought State Regulators Ask EPA to Ban Postemergence Dicamba Use in 2021



4/30/2020 | 1:55 PM CDT
The request is part of an effort to give EPA the data it needs to...

Dicamba Cutoffs Loom Keep Dicamba Cutoff Dates in Mind When Replanting Soybeans



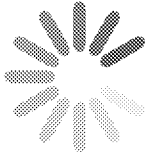
5/21/2020 | 12:49 PM CDT
Some states have dicamba cutoff dates ranging from June 20 to June...

Off-Target, Once Again Amid Legal Limbo, Dicamba Injury on the Rise Once Again

7/9/2020 | 11:43 AM CDT
This summer, Iowa fields are seeing some of the most widespread injury...



Recommended for You



Deere, AGCO Battle Over Seed Placement Technology
MachineryLink

Winter Wheat Harvest
Combines Find Fewer Winter Wheat Acres But Higher Quality

America's Best Shops
From Clucking to Kickboxing

Machinery Chatter
Where Tires Go to Die -- On Purpose

John Deere Rolls Out New 1895 Drill
MachineryLink




DTN[1x3] LBL[article-box] SEL[] IDX[] TMPL[standalone] T[]

Emily Unglesbee



About the Author

Connect with Emily:

 @Emily_Unglesbee